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VOCATIONAL, TECHNICAL AND ADULT EDUCATION. REPORT OF MASTER PLAN COMMITTEE H.

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ILLINOIS STATE BOARD OF HIGHER EDUC., SPRINGFIELD

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THE STUDY COMMITTEE PRESENTED ITS REPORT TO THE BOARD OF HIGHER EDUCATION FOR USE IN DEVELOPING A "MASTER PLAN" FOR HIGHER EDUCATION IN ILLINOIS. INCLUDED WERE--(1) CHARACTERISTICS OF ILLINOIS' UNEMPLOYED, (2) DATA ON HIGH SCHOOL DROPOUTS, (3) THE ROLE, NATURE, AND DEMAND FOR ADULT AND TECHNICAL EDUCATION, (4) A RECOMMENDED PLAN FOR ADULT, TECHNICAL, AND SEMITECHNICAL EDUCATION, AND (5) CONDITIONS FOR SUCCESSFUL TECHNICAL EDUCATION IN 2-YEAR COLLEGES. IT WAS PROJECTED THAT--(1) BY 1970, 58-MILLION PERSONS NOW AT WORK AND STILL EMPLOYED WILL NEED TRAINING TO KEEP PACE WITH NEW METHODS, NEW MATERIALS, AND NEW OPPORTUNITIES, (2) 26-MILLION YOUNG WORKERS STARTING TO WORK BETWEEN 1960 AND 1970 MUST MATCH THE NEEDS OF A CHANGING ECONOMY, AND (3) 3-MILLION WOMEN WHO WILL SWITCH FROM HOUSEWORK TO JOBS WILL NEED MARKETABLE SKILLS IN THE DECADE AHEAD. ILLINOIS SHOULD PROVIDE NEW, COLLEGE-LEVEL EDUCATIONAL FACILITIES AND PROGRAMS TO ENROLL APPROXIMATELY 13,900 FULL-TIME AND 13,200 PART-TIME STUDENTS AT THE TECHNICAL LEVEL (2 YEARS), AND 43,000 FULL-TIME AND 40,000 PART-TIME STUDENTS AT THE SEMITECHNICAL LEVEL (1 YEAR). (PS)

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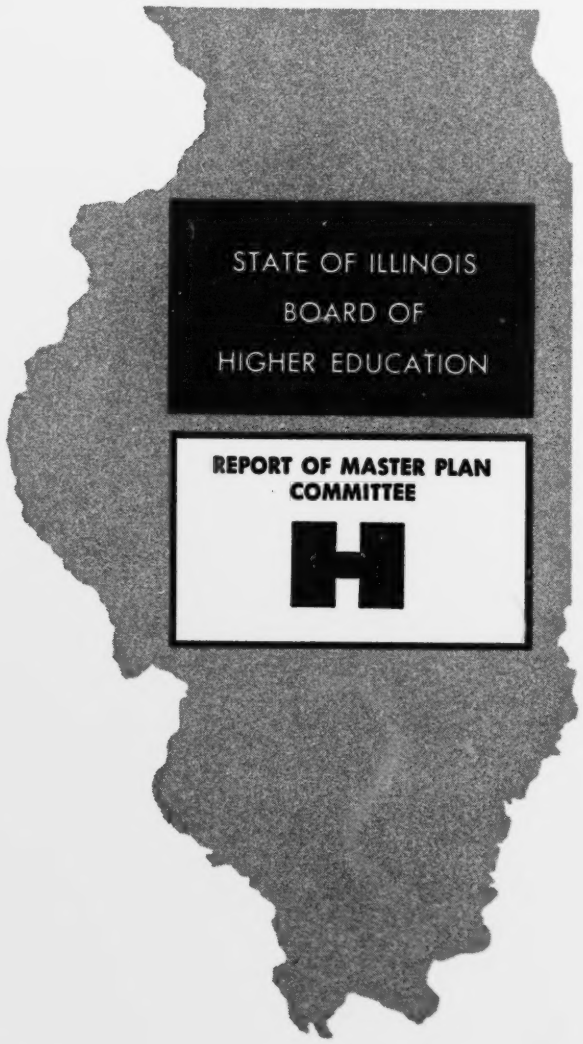

Vocational, Technical and Adult Education

A REPORT TO THE ILLINOIS BOARD OF HIGHER EDUCATION, DECEMBER 1963

VT000414

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H

VOCATIONAL, TECHNICAL AND ADULT EDUCATION

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A report to the Board of Higher Education for its use in developing a "Master Plan" for higher education in Illinois. This report is the work of the study committee and is NOT the work of the Board or its staff.

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councils would be advisory in nature, but would be responsible for the direction of research, experimental programs, and the continuous study and evaluation of programs.

8. Funds and staff should be provided for statewide research into the many facets of adult and continuing education, including a study of the present approaches and offerings in the state.
9. Funds for adult education should be included in the budgets of each of the colleges and universities (two-and four-year institutions) to insure the proper balance and emphasis on this function.
10. Adult education tuition and fees should be flexible in order that the education of groups such as the economically underprivileged, unemployed, and underemployed may be financed by state and/or federal funds.

Technical and Semi-Technical Education

The term technical education is used to mean education for employment in occupations in which two to three years of college-level technical training is essential. Semi-technical education prepares students for occupations requiring competence on advanced skill levels for which one to two years of post-high-school training is needed.

Committee H recommends the following:

1. College-level technical and semi-technical education leading directly to employment should be greatly expanded to meet the needs of business, industry, and services in Illinois for competent employees, and to develop the interests and talents of a large fraction of high school graduates, and of adults who need to expand their knowledge in their lines of work or to learn new fields of work.
2. A statewide system of regional, comprehensive two-year colleges, each with a division of technical education should be established as soon as possible. The plan for Illinois described by McLure and his co-authors may be taken as a tentative model for a statewide plan.[1] Plans for the system should take into account the present publicly supported centers of technical and semi-technical education.

[1] W. P. McLure, G. C. Mann, H. M. Hamlin, M. R. Karnes, and P. Van Miller, Vocational and Technical Education in Illinois. (Urbana: Bureau of Educational Research, University of Illinois, 1960).

3. The organization and administration of technical education in two-year colleges should include:
   (a) Technical education departments organized on the basis of occupational areas served.
   (b) A technical education division within the college, comprised of departments, headed by a director or dean who is responsible to the head of the college.
   (c) A regional board to operate each two-year college.
   (d) A state board to stimulate, accredit, and coordinate the work of all two-year colleges.
   (e) The State Board of Higher Education to coordinate the work of two-year colleges with that of other colleges and universities.
4. The capital and operating costs of the proposed statewide system of comprehensive two-year colleges should be financed entirely at the state level, except for federal support and student tuition and fees. It is believed that problems of high quality, efficient concentration of enrollment, and the attendance by some students at colleges in regions in which they do not live, can best be met by vesting substantial control and insuring full financial support at the state level.
5. Tuition and fee charges should be uniform in all public two-year colleges and in all curriculums.
6. Though the central function of the technical division of a two-year college is offering college-level programs to high school graduates, a secondary function should be to provide educational services to persons beyond high school age who are not high school graduates. Some examples of such services are the following:
   (a) Vocational guidance and counseling.
   (b) Placement in college-level programs on the basis of proven ability, aptitude, and readiness.
   (c) Non-credit courses in preparation for specific jobs.

   Another possible service is the sharing of technical facilities and equipment with local high school vocational programs.

INTRODUCTION

Accelerating technological and scientific developments resulting in the introduction of new materials, processes, and products are radically affecting every phase of human endeavor. Because

of the unparalleled technological developments taking place in industry, business, agriculture, and the professions, present educational facilities and programs are no longer adequate to meet the increasing demands for technical and semi-professional workers between the skilled and professional levels of employment, requiring specially planned college-level education of less than the usual four years. These vast changes and their corresponding effect upon manpower needs have also resulted in an ever-increasing awareness among adults of all ages, education, and social backgrounds of the need of continuing education.

However, realistic planning for an effective educational organization of the future is not possible without a review of the school drop-out rate and unemployment ratio and educational level of our youth and adults. Therefore it is the purpose of this report to evaluate the pertinent statistics for Illinois, to examine the ultimate function of technical and adult education, and to make recommendations for the framework of these facets of the total educational pattern.

Characteristics of Illinois' Unemployed

One of the most serious problems facing our state and nation at the present time is the increasingly high percentage of unemployed. In June, 1961, Governor Kerner established a committee on unemployment composed of representatives from labor, government, and the educational institutions "to examine unemployment in our State, determine its characteristics and causes, assess the techniques currently used to meet the problem, and recommend additional steps that should be taken."

The committee found that unemployment today is largely a problem for the unskilled worker, the one with obsolescent skills, the young worker, and the non-white.

A special Job Seekers Survey made by the Illinois Department of Labor showed the following characteristics of the unemployed in Illinois:[2]

1. They have completed fewer years of schooling than has the average adult in the state (Table I).
2. They have been unemployed for a long time–45% of the state's job-seekers (August, 1961) had been unemployed for five months or longer.
3. They have been largely employed in manufacturing.
4. Almost 30% of them are non-white, but their representation in the labor force is only a little over one-third as high.

[2] Report of the Governor's Committee on Unemployment-Illinois, January, 1963, Chap. I, The Unemployed, pp. 5-11.

5. They are generally (71%) willing to take training. Only 35% are willing to relocate. More job-seekers in non-metropolitan area counties than in metropolitan areas are willing to move to get new jobs.

The committee also found that the average adult has completed about ten and one-half years of schooling, which is about average for our country; however, the number of adults in Illinois who have completed four years of college as a whole is 5% lower than the national average.

There have been sizable shifts in the composition of the labor force of our nation during the past decade. The greatest rate of increase has occurred in the professional, technical, and salaried manager groups, and largest rate of decrease in agriculture, mining, and transportation occupations, particularly at the unskilled and semi-skilled levels. Each of these changes indicates the need for longer school retention and improved programs of education closely geared to changing job requirements. Manpower studies also clearly indicate that high school graduation is no longer enough and that more young people must be encouraged to continue their education beyond high school.[3]

The school enrollment of the 14-22 age group in Illinois, shown in Table II, indicates the seriousness of the school drop-out problem at both the high school and college level. A careful analysis needs to be made of these drop outs. Committee B's report on college-level drop-outs should be considered as part of the total solution of the unemployment problem and the future educational program, particularly in the two-year colleges and technical institutes.

TABLE I

Years of Schooling Completed by Unemployed and Employed Workers, Illinois, 1960

Years of Schooling Completed	Per Cent	
	Job Seekers	Adult Population
7 years or less	16.7	19.1
8 through 11	51.0	41.5
12 (generally, high school graduation)	25.0	24.5
13-15 (some college)	5.8	8.6
16 or more (generally college graduation or more)	1.5	7.3

[3] U.S. Department of Labor, Manpower, Challenge of the 1960's, 1961.

This does not imply that raising the educational standards alone is a panacea for the nation's unemployment. However, there is much evidence to indicate that a higher level of functional education would greatly reduce unemployment. First, it is known that many jobs are unfilled because of a lack of qualified job-seekers (the scarcity of teachers, to mention one). An examination of "help wanted" advertisements will show practically no calls for "young men willing to do any kind of work." There will be many calls for men capable of doing some specific job such as electronic technician, engineer's aide, medical technologist, accountant, draftsman, secretary, etc. Second, through education and research many new products are developed and new jobs created for those who possess the essential skills and know-how. Thus economic growth is stimulated and unemployment reduced.

High School Drop-Outs

Planning for adult, vocational, technical, and continuing education must take into account that segment of the population which has not graduated from high school, commonly referred to as "drop-outs." These people make up the largest portion of the unemployed. They have the fewest skills and usually are weak in the basic educational requirements prerequisite to further vocational or technical training.

The best available data indicate that currently the four-year drop-out rate for high school students in Illinois is about 31%. A study by the Office of Education of the U.S. Department of Health, Education, and Welfare for the school year 1959-60 reported the drop-out rate for Illinois to be 30.5%. A report by the Illinois Association of School Boards shows 40,436 drop-outs (32%) for the graduating class of 1961 and 37,467 (31%) for the class of 1962.

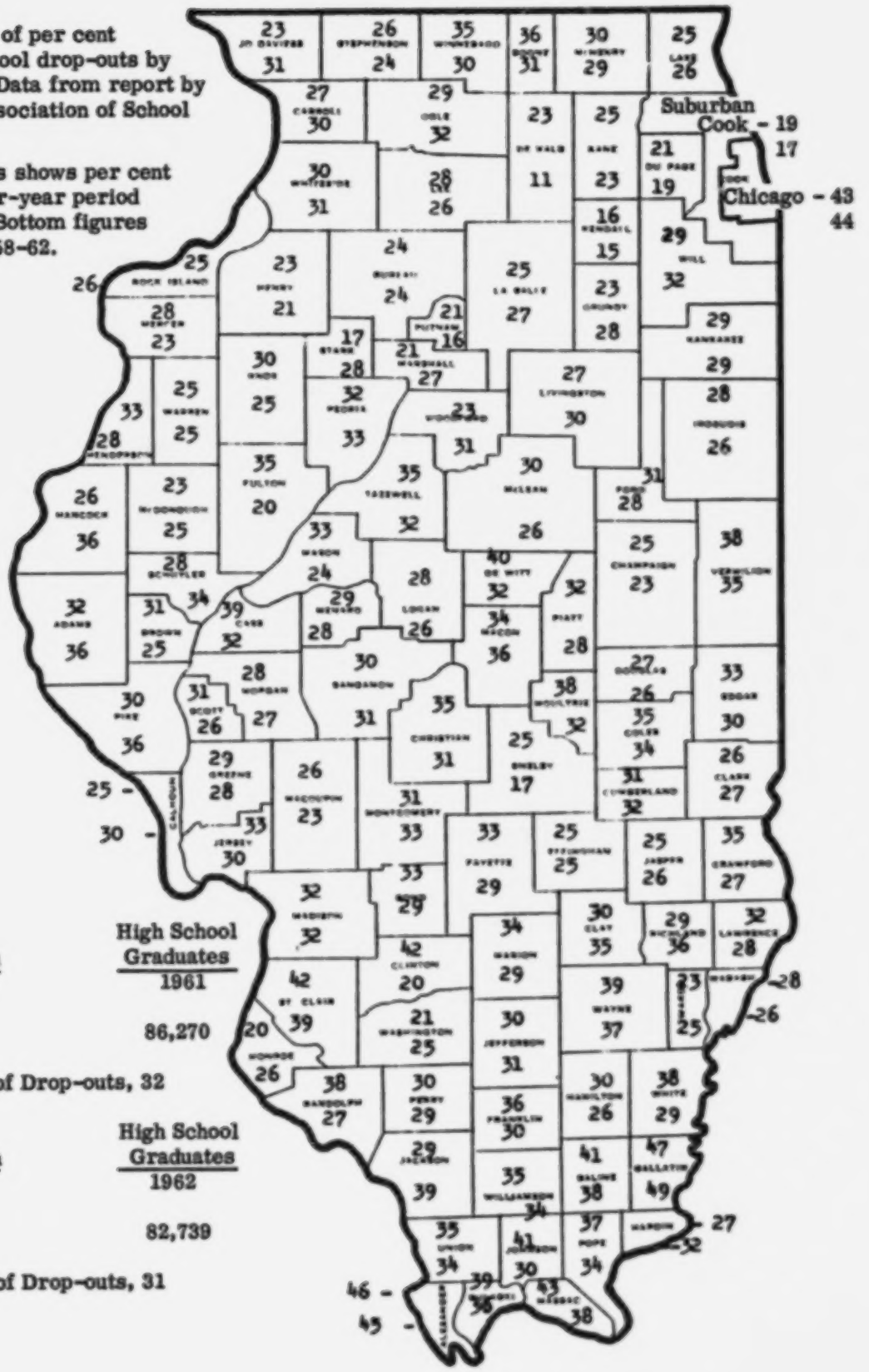
Drop-out rates vary widely among school districts, ranging from a low of 10% to a high of 50%. The accompanying map shows the percentage of drop-outs by counties as tabulated in the report of the Illinois Association of School Boards for the graduating classes of 1961 and 1962.

The Report of the Governor's Committee on Unemployment – Illinois, published in January, 1963, contains an interesting and informative section on drop-outs. Quoted here are several excerpts:

> - - - - holding young people in school
>
> A major task of the schools, keeping students through high school graduation, is a massive assignment; the size of this task comes as a disquieting surprise to people first meeting

Tabulation of per cent of high school drop-outs by counties. Data from report by Illinois Association of School Boards.

Top figures shows per cent for the four-year period 1957-61. Bottom figures are for 1958-62.



Freshmen 1957-8	High School Graduates 1961
126,706	86,270

Per cent of Drop-outs, 32

Freshmen 1958-9	High School Graduates 1962
120,206	82,739

Per cent of Drop-outs, 31

TABLE II

ILLINOIS SCHOOL ENROLLMENTS - HIGH SCHOOL AND COLLEGE AGE[a]

Age	Total Population		Number Enrolled In School		Number Not Enrolled In School		Per Cent Enrolled in School	
	Male	Female	Male	Female	Male	Female	Male	Female
14	71,044	68,259	67,752	65,162	3,267	3,070	95.4	95.5
15	70,907	69,637	66,501	65,143	4,396	4,529	93.8	93.5
16	74,585	73,245	65,363	63,454	9,252	9,819	87.6	86.6
17	78,532	75,981	59,169	57,050	19,409	18,915	75.3	75.1
18	66,073	66,123	34,563	28,681	31,523	37,404	52.3	43.4
19	54,675	61,211	19,685	15,556	34,996	45,688	36.0	25.4
20	51,713	60,735	14,051	10,929	37,607	49,788	27.2	18.0
21	55,809	62,776	13,194	7,999	42,713	54,985	23.6	12.7
22	56,245	62,056	10,207	4,220	46,185	57,839	18.1	6.8

[a] U.S. Bureau of Census, U.S. Census of Population: 1960. General Social and Economic Characteristics, Illinois. Final Report PC (1) - 15 C, 1962.

the problem. The year, 1950, was the first year in which half of those who had started fifth grade eight years earlier were graduated from high school; even today only about 60 per cent of all fifth graders remain in school until high school graduation and only two-thirds of those who start high school, graduate.

The consequences for those who do not achieve this level of schooling will undoubtedly be more serious than ever before. Lack of high school education is an almost total bar

to entering a profession,
to getting a white collar job,
to becoming an apprentice,
to entering government service except at the janitorial level.

There are, in fact, few employment opportunities for young people without a high school diploma except in the dead-end, low-pay jobs, particularly those of the service, trade and transportation industries.

Determination of the size and nature of the drop-out problem is the first step towards its solution — and a step that is surprisingly difficult to take. Despite the hundreds of studies that have been done on this problem, there are no comprehensive and continuing statistics showing the percentage of children who drop out at the various levels of school. We suggest therefore, that there is an immediate need to institute, in every school district of the State, collection and publication of accurate statistics on the number and percentage of drop-outs in each school grade. We further suggest that all such information be coordinated by the Superintendent of Public Instruction. This type of information will permit much more effective planning to solve the problem of drop-outs than information obtained from occasional and random studies.

There is now available better information on the rate of drop-outism in the separate states than has existed before; a recent study by the Office of Education of the U.S. Department of Health, Education and Welfare showed the percent of public high pupils who did not graduate four years after enrollment in high school. The range was from 17.8 percent for Hawaii to 42.3 for Alaska. Twenty-seven states had a higher drop-out rate than Illinois. The following is a ranking of the states by their drop-out rates, 1959-60:

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State	Per Cent Not Graduating from High School	State	Per Cent Not Graduating from High School
Alaska	42.3	Kansas	31.0
Georgia	41.9	Delaware	30.5
Virginia	41.9		
Kentucky	41.6	ILLINOIS	30.5
Tennessee	41.2		
Nevada	40.9	Rhode Island	30.4
New Mexico	40.9	Colorado	28.6
S. Carolina	40.9	Pennsylvania	27.9
Louisiana	40.7	Washington	27.8
Mississippi	40.4	Idaho	27.7
N. Carolina	39.9	Montana	27.7
Alabama	39.3	Ohio	27.5
Texas	39.0	Connecticut	26.9
Maryland	38.1	Massachusetts	26.8
W. Virginia	37.9	New Jersey	26.0
Arizona	36.7	Michigan	25.9
Arkansas	36.7	Oregon	24.7
New York	35.0	S. Dakota	24.3
Florida	34.5	Utah	23.8
Vermont	33.6	Wyoming	23.3
Maine	33.5	Iowa	23.2
Missouri	33.3	Nebraska	22.5
Oklahoma	32.6	N. Dakota	21.4
Indiana	32.4	Minnesota	21.0
N. Hampshire	31.5	California	20.5
		Wisconsin	18.3
		Hawaii	17.8

Additional information is also available for Chicago. A study by the Office of Education of school holding power in large cities showed a total drop-out rate of 45.3 percent for a four year period for the three cities of New York, Chicago and Philadelphia. This included both voluntary and involuntary withdrawals, involuntary being defined as those over which the school presumably has no control. These include being drafted into the armed forces, physical disability, and being uneducable or institutionalized. The bulk of the losses were due to voluntary drop-outs, 84 percent of the total withdrawals. It is with this group that we are principally concerned, although a continuing watch needs to be kept over involuntary withdrawals: "uneducable" is an elastic label and its

widespread use will merely change the name of the drop-out problem, not alter its severity.

In Illinois the Chicago public schools report the rate of annual drop-outs, both voluntary and involuntary. In 1960-61, 15,658 children dropped out of high school, 13 percent of the total adjusted enrollment for the year. The true four-year holding power of the city schools is much more difficult to calculate because of extensive transferring. It seems likely, however, that the drop-out rate is not too far off from the national one for large cities.[4]

Summary

A significant number of students, approximately 30%, are dropping out of Illinois high schools before graduation.

Many of these people will desire and need to continue their education by returning to school for vocational, technical, and general programs. Often they will find it difficult, impractical, and even impossible to return to high school.

ADULT EDUCATION

The Role of Adult Education

The changes in our way of life have resulted in an increasing awareness among adults of all ages, education, and social backgrounds of the need for continuing education. Such a perspective is essential in our society, which is committed to democratic processes and ideals; every citizen in a democracy must have the opportunity to seek the rewards of productive work, both economically and socially. Educational institutions at all levels must exert more leadership and responsibility for the education of adults.

The Nature of Adult Education

The committee has defined adult education to include any continuing education for out-of-school youth and adults in courses and programs related to personal, vocational, cultural, or social interest or need. The courses and programs may be credit or non-credit, formal or informal; however, they are primarily a part-

[4] Report of Governor's Committee on Unemployment-Illinois, January, 1963, pp. 75-78.

time activity. Such education should encompass persons of all educational levels, from those lacking a basic common school education, to those with a high level of formal education. It must include:

1. Persons desiring to raise the level of their basic skills, complete high school work or its equivalent, obtain college work, or re-enter an interrupted college program on a part-time basis.
2. Those who wish to supplement or bring up to date a completed degree or certificate program.
3. Those who are upgrading themselves to meet the new technological requirements of their present employment.
4. The unemployed who need training.
5. Those who are interested in cultural, recreational, civic, and social activities.

Adult education is so unlimited that this report must necessarily be limited to those of its phases that seem related to the educational systems in the state. This does not minimize the importance of the contribution made by other organizations and associations in the field.

In addition, the area of specialized or concentrated job training for adults is of such great importance that it will be discussed in another section of the committee report. Furthermore, since it is difficult to define precisely the limits of adult education in relation to job training and other phases of education, there is necessarily some overlapping.

The Demand for Adult Education

National statistics reveal an alarming deficiency in our educational accomplishments:[5]

1. Our nation includes 11,000,000 adults, age 18 and over, who find it impossible to learn marketable skills because they cannot read or write as well as the average fifth-grader.
2. There are 58.6 million adult Americans who have not finished high school, and every year work opportunities dwindle for them. In addition, high school graduates are now being replaced by machines.
3. Leisure time, created by a mushrooming population of retired men and women and a shorter work week for younger workers, has resulted in a frustrating and disappointing experience for millions of adults.

[5] Robert F. Schentz, "Undereducated Adults," NEA Journal, January, 1963, pp. 18, ff.

4. The nation's divorce statistics and high rate of juvenile delinquency and crime are undeniable proof that many people marry and raise children without adequate knowledge of how to cope with the problems of family living and ability to get along with others.
5. The average voter, confronted with problems infinitely complicated, has difficulty becoming well informed without outside help. Hence, millions are ill equipped to make intelligent decisions.

However, these same statistics also indicate that of these millions of undereducated adults:

1. Approximately 449,000 men and women are finishing elementary high school in public school adult classes. An additional 932,000 adults attend public school, business, trade, industrial and technical courses. This total, 1,381,000, represents about 2% of the nation's undereducated 58.6 million.
2. To offset No. 5 above, approximately 75,000 adults take part in civic-public affairs activities organized by their public schools; another 171,000 are learning the rights and responsibilities of citizens through Americanization classes.
3. 132,000 adults (both men and women) attend parent education classes; 71,000 adults participate in personal development and group relationship classes, and 459,000 attend public school courses in homemaking.
4. A recent seven-state survey revealed that California, New Jersey, and New York have the greatest number of senior citizens (almost 64,000) participating in general adult education classes. In addition, vocational courses are available to adults in thousands of public schools in the United States; some more progressive communities are also offering adult courses for retirement.[6]

The Governor's Committee on Unemployment report indicates that employment has become identified as a problem of the unskilled worker or the one with obsolescent skills. It appears that upgrading, training, and education are related to the economic situation and to public aid as well as to personal development of the individual. In addition, there is a current general increase in educational requirements for many jobs; more job opportunities depend upon a high school diploma or its equivalent. Therefore, it is imperative that those adults who have not completed their secondary education, those who need retraining, those who desire additional training, and the many who wish a fulfillment of special

[6] Ibid.

interests be provided adequate educational opportunities through the facilities of the educational institutions of the state.

Basic Plan for Adult Education

A. Colleges and Universities

There has been a trend for many colleges and universities, both two-year and four-year, to offer a vast array of courses for adults, depending upon their own areas of special competence. This array includes extension, extended day, evening school, continuing education, or whatever form and title adult education takes. These excellent opportunities for continued learning are presented in both credit and non-credit courses.

This report is limited to a general discussion of needs and plans for adult education. The Committee on Extension and Public Service has, in its preliminary report, described in considerable detail the present programs and plans of the colleges and universities of Illinois. The report includes an account of the highly successful Cooperative Extension Service operated as a part of the land-grant system of the University of Illinois. It is principally a non-credit offering of informal adult education to rural and urban citizens, made available through a corps of extension personnel distributed throughout most of the state.

A recent nationwide survey by the Center for the Study of Liberal Education for Adults indicated that over 17 million Americans were enrolled in some type of adult education course between June 1, 1961, and June 1, 1962. An additional 9 million were engaged in some form of independent self-education. The major stress of adult education, according to this survey, was found to be practical, rather than academic, emphasizing skills rather than "knowledge."[7]

Many adult students are enrolled in part-time evening programs for which regular college credit is granted, leading either toward specific degrees or toward meeting special licensing, certification, or professional requirements. Special services offered by colleges and universities, especially those in metropolitan areas, include non-credit "community service" -type courses. More complete utilization is thus made of the knowledge and talent of the university staff and the college facilities for conferences, workshops, seminars, and short courses. Many of these non-credit offerings are conducted on academically sophisticated and professional levels. Colleges and universities typically employ two patterns in continuing adult education.

[7] Center for the Study of Liberal Education for Adults, Survey of Adult Education 1961. (Chicago: The Center, 1963).

1. The college campus drive-in or residential plan—service provided in the regular concept and connotation of the campus setting.
2. The retreat plans of 30-50 universities that provide their continuing adult education in the natural and rural beauty of country lodges remote from the noise and tension of large cities and metropolitan areas.

Whatever the environment provided for this type of adult education, one fact predominates: there is a need for greatly expanded residential education offerings for various groups and associations such as bankers, businessmen, secretaries, lawyers, doctors, labor leaders, service-type (restaurant, motel, etc.) personnel, transportation personnel, and many others. These courses can be especially valuable:

1. If they are somewhat independent of the limiting interests and boundaries of any department, school, or college. The resulting flexibility would be highly desirable.
2. If representative educational planning and advisory committees in each of the areas of specialization are utilized for development of course content and curriculums.
3. If recognized leaders within the university staff are supplemented by those from industry, business, and the professions in the adult education faculty.
4. If the administrative and supervisory staff is adequate to maintain effective supervision of instruction and instructional materials, and to expand effectively the scope of the offerings.

If this educational framework can be established and maintained, the impact of adult education, as a facet of university offerings, will be statewide, and even national in some instances. It will:

1. Build a favorable image and strengthen public relations.
2. Provide education for upgrading of personnel on all levels.
3. Educate the public about the expanded functions of a university.

B. Public Schools

Historically, the heart of the adult education enterprise has been the local public school district. The role of the public school for this purpose is both logical and obvious. The public school is, first of all, publicly supported by the same adult population that

requires its services. Second, the public school has existing plant and personnel to teach and administer programs for adults. Third, it is an acceptable and inexpensive facility for all adults. Fourth, as a recognized local educational resource, the public school is able to provide educational leadership to other educational activities for adults through a variety of relationships in the community. Many aspects, however, contribute to the current failure of local schools to meet the demands for adult education:

1. Programs of adult education must be administered, supervised, and taught with different objectives from those on an elementary or secondary level. Hence, many times the available staff is untrained.
2. Local budgetary limitations obviously restrict the scope of offerings.
3. Many public school districts are too small or too remote to offer adult education programs.

This does not mean that a vast amount of exceptionally valuable adult education is not, or cannot be, handled through public school facilities. However, the conditions affecting these offerings are similar to those noted above for university and college programs.

C. Other Agencies

Many local agencies (YWCA, YMCA, art centers, theater groups, music appreciation groups, etc.) provide outstanding programs that are available to the public. These activities are not only a social outlet for the participants, but they influence the cultural level of the community, thus functioning as another facet of adult education.

D. Educational Television

The use of instructional television in the Chicago junior colleges shows that courses at this level can be taught effectively to a home audience by this medium. It brings into the educational system a new and older group of students who are strongly motivated to continue their education but who have been kept from doing so by various circumstances. Once started in higher education by television, they are likely to continue to a junior or senior college degree. Because of the high motivation of mature students, nearly two-thirds (65%) of these students finish their courses and take final examinations.

A highly effective junior college course can be planned, organized, and presented on television. An effective classroom teacher can learn to be an effective television teacher, but this requires time and preparation. When evaluated by techniques of measurement and analysis, television instruction is found to be a thoroughly effective means of extending college opportunities.

Students may achieve as much through television as in the conventional classroom groups. Many students take courses concurrently on television and in the classroom. Some students have received the Associate in Arts degree for work done entirely by television. Two-thirds of television students have indicated a plan to graduate from the two-year college. Most of those who succeed with the television courses seek to register for more courses the following semester. Many are prospects to fill the ranks of the teaching profession, particularly women with declining home responsibilities.

The use of television spreads existing facilities to take care of more students but may have the net effect of requiring more classroom space and more personnel time because it builds an appetite in the community for more higher education. The cost of educating credit students by television in large numbers is comparable with the costs of classroom instruction.

New courses need to be introduced each semester to maintain over-all enrollments. Since enrollments usually drop for the second semester of two-semester sequences, it seems best to offer courses on television for only the first semester and give the second semester in the classroom. Non-credit enrollments approximate three times the number enrolling for credit. Credit enrollments tend to be high in courses required for the Associate in Arts degree. Non-credit enrollments tend to be high in the skill courses in language, mathematics, and business fields.

Summary

The magnitude of the educational job ahead is staggering when the employment pattern is examined. The President's Panel of Consultants on Vocational Education[8] reports that by 1970, 87,000,000 will be in the full-time labor force, consisting of:

1. 58,000,000 now at work who will still be employed and will need training to keep pace with new methods, new materials, new opportunities.
2. 26,000,000 young workers starting to work between 1960 and 1970. Their aptitudes, skills, and education must match the needs of a changing economy.
3. 3,000,000 women who will switch from housework to jobs will also need marketable skills in the decade ahead.

[8]Report of Panel of Consultants on Vocational Education, Education for a Changing World of Work, Office of Education Publication No. 80021, Washington, D. C.

The urgency of adult education becomes obvious when present and future occupational, social, and cultural needs are placed in proper focus. It is imperative that proper steps to meet these needs be initiated immediately.

TECHNICAL AND SEMI-TECHNICAL EDUCATION

The Role of Technical and Semi-Technical Education

As a consequence of the accelerating technological revolution there is an increasing need everywhere for trained and educated people. The demand is great at all levels of education but the concern of this section is education for technicians, business and office workers, skilled craftsmen, and other categories of workers whose fitness for their work can be greatly improved by one or two years of specially planned college-level education.

Fortunately, the interests of youth and of the state and nation coincide in a first-rate program of technical education. Every high school graduate should have the opportunity to prepare for a job commensurate with his interests and talents. The number of job opportunities for young men and women without specialized skills and knowledge is steadily decreasing. At the same time, Illinois and the nation must have many more and better trained workers to maintain their positions in national and world competition. The need for expansion of technical education has been documented in state and national studies and reflected in federal programs to support technical education in the states.

The crucial role of vocational and technical education in solving the employment and economic problems of Illinois is discussed at length in the recent comprehensive report of the Governor's Committee on Unemployment. The following quotations illustrate the point of view and recommendations in this important study:

> As society becomes increasingly industrialized and scientifically oriented, the relationship between education and industrial processes grows closer. Advancing technology not only substitutes more productive for less productive processes; it substitutes more productive people for less productive ones. And education and training are the basic means of raising the individual's productivity and thereby keeping him at work. . . .
>
> Just as advancing technology created the need for technicians functioning as the bridge between creative engi-

neers and scientists and the production men, so do the expanding needs of business, government, educational institutions and industry call for better educated and more knowledgeable assistants. Today the minimum educational qualification for clerical and sub-professional occupations is high school graduation; the average requirement is higher and in the process of rising

. . . .

There is now a considerable body of evidence showing that since the turn of the century only about half the nation's increased output has been due to increased expenditures on capital and equipment; the other half has resulted from increased education — more skilled labor, greater amounts of research resulting in technological advance and improved management techniques

. . . .

We recommend that technical education be established either in technical institutes or in junior colleges with technical curricula and coordinated with regional vocational schools which would be within easy commuting distance of almost every one in the State", and again, "We strongly urge that planning for establishment of junior colleges be linked with planning for technical institutes and vocational education centers, so as to achieve the most economical and effective system.[9]

The national projection of employment by major occupational groups, 1960 to 1970, by the U. S. Bureau of Labor Statistics is shown in Table III. The noteworthy feature is that the occupations in which demand for workers will rise faster than average are the ones in which the most education is required: professional and technical workers and clerical and service workers. The fraction of the total work force in occupations requiring the least education will decrease.

The most comprehensive study of the need for expanded vocational and technical education in Illinois was completed in 1960 by the Bureau of Educational Research, College of Education, University of Illinois, for the Office of the Superintendent of Public Instruction. The data and conclusions for Illinois in this report are based primarily upon that study. Although these data are for years preceding 1960, it is evident that developments in recent years are not keeping pace with the increasing needs for technical

[9] Report of the Governor's Committee on Unemployment-Illinois, January, 1963, Chap. IV, Education and Training, A Cornerstone, pp. 66, 96, 97.

TABLE III

Employment by Major Occupational Group, 1960 and Projected 1970

	Employment				Change 1960-70	
	1960		1970[a]			
	Number (millions)	Per Cent	Number (millions)	Per Cent	Number (millions)	Per Cent (rounded)
All Groups	66.7	100.0	80.5	100.0	13.8	21
Professional, technical, and kindred workers . . .	7.5	11.2	10.7	13.3	3.2	43
Managers, officials, and proprietors, except farm	7.1	10.6	8.6	10.7	1.5	21
Clerical and kindred workers	9.8	14.7	12.8	15.9	3.0	31
Sales workers	4.4	6.6	5.4	6.7	1.0	23
Craftsmen, foremen, and kindred workers . . .	8.6	12.8	10.3	12.8	1.7	20
Operatives and kindred workers	12.0	18.0	13.6	16.9	1.6	13
Service workers.	8.3	12.5	11.1	13.8	2.8	34
Laborers, except farm and mine	3.7	5.5	3.7	4.6	---	---
Farmers, farm managers, laborers, and foremen.	5.4	8.1	4.2	5.3	-1.2	-22

[a] Projected by U.S. Bureau of Labor Statistics.

education in the state. The analyses and proposals in the study, though calling for a great leap forward, are conservative in relation to the needs of the state for post-high-school technical education and to developments in other states with comparable economic base and levels of industrial activity.

Following the study referred to, the major occupational categories may be classified in four groups on the basis of the amount of formal education required:

1. Professional - occupations that require extensive periods of formal education (four to eight years).
2. Technical - occupations for which two to three years of college-level technical training is essential.
3. Semi-technical - occupations requiring competencies on semi-technical or advanced skill levels and for which one to two years of post-high-school training is usually needed.
4. Vocational - occupations for which training may be given as a part of a high school program.

It is not easy or necessary to draw sharp lines between these groups. This section, however, is primarily concerned with evaluating the needs of the state with respect to Groups 2 and 3, namely, occupations requiring technical and semi-technical education, and with outlining a basic plan to meet these needs.

The Nature of Technical Education

Typical occupations that require the technical level of education include those of engineering technicians; architectural and structural draftsmen; medical, dental, and scientific technicians; production technicians; business specialists of many kinds; technical specialists in agriculture and related industries; and many others. These fields are characterized by a special application of knowledge from the basic fields, such as mathematics and science. Preparation includes not only specialized courses in the techniques of the occupation but also a body of general and related knowledge. The standard of performance in these occupations includes a considerable degree of flexibility and resourcefulness.

The McLure study describes or lists the contents of a number of one- and two-year curriculums in industrial, business and agriculture-related programs.[10] As a sample of a high-level technical program, an Electronic Technology curriculum is given below.

[10] Ibid, pp. 51-74.

It is one of a series of curriculums prepared and described in detail by groups of engineering educators and practicing engineers under the auspices of the U. S. Office of Education.[11] It is not a pre-engineering curriculum. A graduate of this curriculum will have a good foundation in the principles of electronics and considerable facility with the "hardware" encountered in the electronics industry. It is assumed that the entering student will have graduated from high school in a program that includes two to three years of mathematics, a year of physics, and a year of chemistry.

ELECTRONIC TECHNOLOGY CURRICULUM

First Year

	Hours per week Class	Lab
First Semester		
Technical Mathematics (Algebra and Trigonometry)	4	0
Direct Current Circuits and Machines	3	6
Social Science	3	0
Technical Drawing	1	6
Communication Skills	3	0
	14	12
Second Semester		
Technical Mathematics (Analytical Geometry and Calculus)	4	0
Time Varying Circuits	3	6
Basic Electronics	3	6
Shop Processes	1	2
Technical Report Writing	1	0
Graphic Analysis	1	3
	13	17

[11] Area Vocational Education Program Series No. 2. Electronic Technology, U.S. Office of Education Circular No. OE-80009.

Second Year

	Hours per week Class	Lab
Third Semester		
Engineering Science	3	3
Circuit Tracing	1	3
Special Electronic Circuit and Design	3	6
Transmitter Theory and Operation	3	6
	10	18
Fourth Semester		
Research Report (Special Problem)	0	6
Ultra-High Frequencies and Microwaves	3	6
Television Circuits	3	6
Industrial Electronics	3	6
	9	24

The Demand for Technical Education

Industry in Illinois is highly diversified, and the industrial trends in the state are remarkably like those in the nation as a whole. With one exception (textile mills), the top ten industries in the nation are the top ten in Illinois. Hence, a statewide program of technical education proportioned to meet the needs of Illinois will also correspond to national needs for trained men and women. It will prepare Illinois youth to adapt to the mobility of population and the changing requirements of industry that characterize the economic development of the nation.

Accurate estimates of the work force requiring technical education are difficult to make. McLure and his co-authors, assuming that the need in Illinois for additional workers and replacements in each of forty major occupational fields parallels the national need in these fields, came out with the following numbers of graduates of vocational and technical curriculums, needed annually in Illinois in the mid-1960's:[12]

Technical level (2 years college)	20,366
Semi-technical level (1 year college)	44,745
Vocational level (high school)	47,539

To show that these numbers are conservative, the estimated numbers needed annually in the 1960's for replacements and additions in a few occupations are related below to an assumed Illinois population of 10,000,000 and a gross state product of 40 billion dollars (approximately 7 per cent of current GNP).

[12]McLure et al., op. cit., Chap. II.

Occupation	Number of NEW Trained Persons	
	Needed annually in Illinois	Needed annually in Illinois per 10,000 population, or per $40,000,000 gross state product
Engineering Assistants	2790	2.8
Technicians (Medical, Dental, Scientific)	890	.9
Accountants	2340	2.3
Purchasing Agents	280	.3
Office Workers	15740	15.7
Printers	1350	1.4
Cosmetologists and Barbers	1540	1.5

The estimated numbers of new workers needed are also conservative in that not all occupations are included. It should also be emphasized that the enrollments in any year should be about three times the number of graduates needed.

Accurate and comprehensive figures of current enrollments and graduations in organized occupational curriculums are not available but the following figures will show that in Illinois they fall far short of the above estimates of the numbers needed.

In Illinois, in 1958, approximately 8,700 full-time and 3,100 part-time students were enrolled in organized occupational curriculums, in both public and private post-high-school institutions; the number of graduates in 1958 was about 2,600.[13] Unpublished data assembled by the same source show that the numbers did not change appreciably between 1958 and 1960.

The enrollment in engineering-related technical education programs in Illinois which are partially supported by federal funds under the National Defense Education Act (Title VIII) has increased from 441 in 1959 to 1,835 in 1963 (full-and part-time). These include some high school programs. Illinois does not at present have the basic facilities and programs with which to expand its technical education. Under Title VIII, the federal government will provide fifty per cent of the operating costs, on a matching basis, for programs in engineering technology and some other areas. In 1961, $375,000 was allocated to Illinois but only $168,000 was claimed and used.

[13]Organized Occupational Curriculums in Higher Education, U.S. Office of Education Circular No. 632, 1958.

At all events, it is apparent that the enrollments in technical education in Illinois are very far below the numbers needed to produce the 20,000 graduates from technical curriculums, and 45,000 from semi-technical curriculums, who could effectively be employed annually in Illinois.

In their study, McLure and his associates made a second estimate of the need for technical education in Illinois,[14] this time expressing the results in terms of a desirable plan for public technical education. For this estimate it was assumed that by 1965 or 1970, Illinois should aim approximately for the per capita enrollments in technical education that California had attained in 1957, namely, 20 full-time and 14 part-time students per 10,000 gross population. In the same year, 1957, the corresponding numbers in Illinois were 6 full-time and 3 part-time students per 10,000 population.

California and Illinois are similar in population, industrial development, distribution of occupations, and average per capita income. Each has special strategic factors that contribute to its position in the American economy. California has a big lead, however, in providing many kinds of technical education that are of great importance in the rapidly developing technology of industry and business and in public and private services.

In this second estimate, after allowing for an enrollment of about 5,000 full-time students in the private technical colleges and institutes, the calculations led to needed enrollments in public institutions at the technical level of 13,887 full-time and 13,190 part-time students. The plan for distributions of these students among the necessary curriculums will be discussed later. This goal for 1965 or 1970 is a much more modest one than that implied by the earlier estimated annual need of approximately 20,000 graduates in technical education. The curriculums typically require two years of full-time attendance. Taking account of drop-outs and part-time study, the annual number of graduates in the second estimate would be less than one third of the annual enrollment, perhaps 6,000 to 8,000 per year. Assuming an additional 2,000 graduates from the 5,000 enrolled in private institutions, the total number graduated annually would be about 9,000, or less than half of the estimated 20,000 additional workers and replacements needed annually in 1965. These figures are rough estimates but they are conservative and show that even with this very large increase in numbers enrolled in technical education, at least half of the needs of the state for technical workers would have to be met by on-the-job training, or by bringing in technically trained personnel from out of the state.

[14]McLure et al., op. cit., p. 48, and Appendix C, p. 147.

The Demand for Semi-Technical Education

The semi-technical level of occupation includes mechanics and repairmen for office machines, computers, machinery, transportation equipment, radio and television; structural metal workers; operators and maintainers of heavy machinery and equipment; automotive specialists; skilled craftsmen who require post-high-school education, in some cases as a part of apprentice training; general business assistants; farm service technicians; aircraft maintainers; laboratory assistants; and many other categories.

The diversity of such occupations is very great and it is not easy to define the boundaries of the group. The essential characteristic of the group is that the formal education required cannot ordinarily be completed in a vocational program in high school, but can be accomplished in a year of concentrated post-high-school study. As compared with technical education, there is less emphasis on cognitive knowledge and more on manipulative skills.

As noted above, the McLure study concluded that the annual number of workers at the semi-technical level of training needed in Illinois in the mid-1960's is approximately 45,000. Current enrollment figures in college-level semi-technical education in Illinois are not available. It is safe to say, however, that such enrollments are a very small fraction of the numbers of trained persons needed annually.

Recommended Plan for Technical and Semi-Technical Education

McLure and his co-authors identified 44 curriculums in technical education most important for Illinois and distributed the numbers of students given above (approximately 13,900 full-time and 13,200 part-time) among the curriculums in proportion to the relative need for new workers and replacements in the various occupational fields. They also proposed a reasonable number of centers in the state in which each curriculum should be offered, on the basis that efficient and economical operation requires that the enrollment in a curriculum should be at least 50 full-time and 60 part-time students, or the equivalent. The results of this distribution, given in Table IV[15] are the basis of a plan for technical education which would bring Illinois to the level attained by California in 1957.

A plan for the distribution of semi-technical education among centers is given in Table V.[16] Here 32 curriculums are identified as most important in terms of numbers of workers required. Since enrollment data in the nation or in individual states are not

[15] Ibid., p. 85, Table 21.

[16] Ibid, p. 87, Table 22.

available, the most important consideration in determining the desirable enrollment is that the estimated number of semi-technical workers needed is two to three times the number of technical workers. It is also assumed that education of this kind will not be available in private institutions. The total enrollments in semi-technical education proposed in Table V are therefore approximately 43,000 full-time and 40,000 part-time.

The proposed enrollments in Table V are for the state as a whole. The numbers of centers in which the curriculums should be offered, however, are given only for the part of the state outside of metropolitan Chicago, that is, in the areas where compromise between an efficient enrollment and distance from the center may be necessary.

The McLure study did not intend to describe in detail a plan for technical education in Illinois. Changing industrial technology, for example, will require new curriculums and different emphasis among curriculums. Studies are underway to secure more accurate data on the needs for specific kinds of training and on the development of curriculums to meet up-to-date needs. The University of Illinois and Danville Junior College, for example, are making a detailed survey of the need for engineering technicians in Vermilion County. Tables IV and V, however, do give a clear picture of the scale on which public technical and semi-technical education at the post-high-school level must be organized, if even half of the workers in these categories needed annually in the state in the middle 1960's, are to be educated.

Conditions for Successful Technical Education in Two-Year Colleges

If the two-year colleges are to meet successfully the comprehensive educational needs of high school graduates and adults, they will need to serve a number of purposes including the following: (1) Providing courses appropriate to the first two years of baccalaureate degree programs; (2) Offering a wide variety of curriculums designed to prepare students, in a period of approximately two years or less, to meet the entrance requirements of technical and semi-technical occupations needed in the region, state, or nation.

Committee H here calls attention to an excellent statement of conditions that must exist if technical education is to succeed:[17]

[17]Ralph Wenrich, Unpublished Address, "The Administration of Technical Education in a Comprehensive Community College," American Technical Education Meeting, Milwaukee, Wisconsin, December 2-4, 1962.

TABLE IV

Desirable Enrollments for Post-High School Technical Curriculums in Public Institutions of Illinois

Curriculum	Number of Students			Number of Regions to Offer Curriculum
	Full-Time	Part-Time		
	For Graduation	For Graduation	Adults Up-Grading	
Industrial				
Aeronautical Design, Maintenance, and Management	85	20	40	1
Air Conditioning, Heating, and Refrigeration	200	80	160	4
Architectural Technology	200	80	160	4
Building Construction	295	120	240	6
Civil Engineering Technology	200	80	160	4
Structural Technology	87	20	40	1
Chemical Technology	240	100	200	5
Electrical Construction and Wiring	160	60	120	3
General Electrical Work	585	200	400	10
General Electronics	876	200	400	10
Radio and TV Technology	400	160	320	8
General Engineering Technology	644	200	400	10
Industrial Technology	120	60	60	3
Automotive Technology	550	200	200	10
Diesel Technology	197	60	120	3
Drafting and Machine Design	550	200	400	10
Mechanical General	552	200	400	10
Tool and Die Design	150	60	120	3
Industrial Photography	80	40	---	2
Welding Technology	200	80	80	4
Total	6,371	2,220	4,020	
Non-Industrial				
General Agriculture	563	200	400	10
Industrial and Service Agriculture	42	20	40	1
Animal and Poultry Husbandry	200	100	200	5
Dairy Technology	50	20	---	1
Floriculture and Horticulture	120	60	120	3
Commercial Art and Advertising	400	140	280	7
Apparel (Fashion) Design	120	60	120	3
Graphic Arts	80	40	---	2
Publishing and Printing Technology	80	40	---	2
Accounting	827	200	400	10
General Business	1,420	200	400	10
Hotel Management	120	60	60	3
Insurance and Real Estate	120	60	120	3
Sales and Distribution	340	140	280	7
Special Technical Secretarial Work	1,430	200	400	10
Dental Hygiene	350	140	---	7
Dental Laboratory Technology	95	---	---	2

TABLE IV

Desirable Enrollments for Post-High School Technical Curriculums in Public Institutions of Illinois (continued)

	Number of Students			
	Full-Time	Part-Time		
	For Graduation	For Graduation	Adults Up-Grading	Number of Regions to Offer Curriculum
Non-Industrial (continued)				
Medical Office Assistant	180	60	120	3
Medical and Biological Laboratory Technology	240	100	100	5
Nursing (Two- and Three-Year)	611	200	---	10
General Home Economics	200	80	160	4
Clothing and Textiles	160	60	120	3
Food Administration	120	60	120	3
Police Methods Technology	190	200	300	5
Total	8,058	2,440	3,740	
Total Industrial and Non-Industrial	14,429	4,640	7,760	

1. The administration of the college must be clearly committed to the idea of providing occupationally oriented programs for those youth who are not planning to go into a four-year college and for adults already employed in the region.
2. The administration and faculty of the college must fully accept, as a major task of the institution, the goal of preparing youth for employment in technical and semi-technical occupations, and of serving the occupational training needs of employed youth and adults.
3. The internal administration structure must facilitate the development of both the college parallel and occupationally oriented programs. Every institution should be organized to assure the efficient achievement of its goals. If one of the goals is to prepare youth for employment, the administrative structure should be designed so that this goal can be achieved. If the two-year college is to serve two major purposes, then it will need to have two major divisions, each headed by a Dean or Assistant Dean.
4. The technical division should be organized on the basis of related occupational areas to be served, such as Engineering Technologies, Industrial, Medical, Dental or

TABLE V

Desirable Enrollments for Post-High School Semi-Technical Curriculums in Public Institutions in Illinois

Curriculum	Number of Students		Estimated Centers for Instruction (excluding Chicago metropolitan area)	
	Full-Time[a]	Part-Time	Regional Centers	Extension Centers Within Regions
Industrial				
Aircraft Maintenance	200	100	1	0
Automotive Maintenance	1,960	650	7	14
Building Construction	3,801	1,770	7	14
Chemical Laboratory Assistantship	440	660	3	0
Cooking and Baking	1,930	360	7	14
Electrical Work	2,078	2,500	7	14
General Industrial Drafting	864	800	7	0
Machining	2,400	2,500	7	14
Mechanics and Repair Work	3,497	1,400	7	14
Metal Smithing and Sheet Metal Work	441	600	3	0
Painting and Decorating	1,248	500	7	7
Patternmaking	441	120	3	0
Plumbing and Pipe Fitting	770	1,400	7	0
Printing	1,295	1,200	7	7
Radio and TV Maintenance and Repair	1,153	800	7	7
Structural Metal Work	440	400	3	0
Surveying	576	100	7	0
Tool and Die Making	777	500	7	0
Welding	588	600	7	0
Wood Technology	1,536	1,520	7	7
Total	26,435	18,480		
Non-Industrial				
Accounting and Bookkeeping	2,246	2,000	7	14
Advertising Display	518	500	7	0
General Agriculture	1,080	2,700	7	14
Specialized Agriculture	1,440	12,300	7	14
General Business	1,875	500	7	14
Cosmetology	1,545	---	7	14
Home Economics (Occupational)	1,120	1,000	7	7
Business and Commercial Photography	287	200	2	0
Practical Nursing	1,000	---	7	7
Real Estate and Insurance	577	500	7	0
Salesmanship	1,809	1,000	7	14
Senior Advanced Secretarial Work	3,022	1,000	7	14
Total	16,520	21,700		
Total Industrial and Non-Industrial	42,955	40,180		

[a] Distribution according to potential enrollments needed for worker replacement demands in Illinois.

Health, Agricultural, Business, Graphic Arts, etc., each with majors in the specific technology.

5. Administrative and supervisory offices in the organization must be staffed with specialists who understand occupational education and who are responsible for development and operation of the occupationally oriented program. They should be given the responsibility and authority to develop and operate programs for which there is an identifiable need, as determined through occupational surveys and student interests.
6. The ultimate quality of a curriculum depends on the quality of its faculty. These attributes are desired of all college teachers: intelligence, a genuine interest in students, personal and professional integrity, a capacity for communicating ideas in oral and written form, a thorough knowledge of subjects taught and skill in the fundamentals of the teaching-learning process. These attributes may not be entirely represented by formal academic training. The faculty may not necessarily be required:
   (a) To meet current certificate requirements in the public school programs;
   (b) To meet formal degree requirements of regular collegiate academic programs.

   Since the technical and semi-technical curriculums educate students primarily for specialized areas, it follows that a significant proportion of the faculty must have had relevant industrial experience and that this experience must be reasonably current. In some fast-moving technological fields, experience over ten years old can be as much a handicap as an asset. Faculty members must be required (a) to maintain technical competence in their fields through participation in technical and professional societies and (b) to engage in work in industry or in research. They must be urged to keep up with the literature of their fields, to continue their education, to attend professional meetings, and to experience first-hand what is taking place in the industries related to their specialties. Time and financial assistance should be provided to encourage such growth. Promotions should be based on a balanced judgment of the instructor's capability to bring broad experience and academic background to bear on his teaching and not solely on the acquisition of higher academic degrees.
7. Provision must be made in the administrative structure for

continual curriculum development. Programs must be continually evaluated, revised when necessary, dropped when no longer needed, and new programs added as needs dictate.

8. Policies regarding student selection should be carefully developed. Admission into technical programs should be based upon high but realistic standards. These standards would not be the same for all programs.
9. Special counseling, advisement, and placement services must be made available to two-year technical students. Follow-up of all graduates is also necessary if the program is to meet changing occupational needs.
10. The extensive use of advisory committees in each of the major occupational areas is essential. These advisory committees must include both regional and state-wide representation, and must include representatives of the occupation for which training is offered and of professional organizations.

Summary

The interests and talents of a large fraction of young Illinois men and women and the needs of business, industry, and services in the state meet in the demand for a great statewide expansion in first-rate, college-level, one- and two-year programs in technical and semi-technical education. Professional-level education is necessarily becoming more theoretical and sophisticated as new basic knowledge is rapidly brought to bear in the applied fields. A serious gap is developing in education for the actual operation of the increasingly complex equipment and procedures that are characteristic of industry and the professions--construction, automated manufacturing, communications, the health professions, business data processing, to name only a few. Such education is desired by many high school graduates and by adults who need additional training or retraining in a new field.

McLure and his co-authors calculate conservatively that annually, in the mid-1960's, Illinois could use effectively, as additional workers and replacements, 20,366 graduates of two-year technical curriculums and 44,745 graduates of one-year semi-technical curriculums.

Our proposal, again following McLure, is a more modest one, namely, that as soon as possible Illinois should provide new col-

lege-level educational facilities and programs to enroll approximately the following numbers:

	Full-time Students	Part-time Students
Technical level (2-year)	13,900	13,200
Semi-technical level (1-year)	43,000	40,000

The graduates from such enrollments, together with graduates from private technical schools, might provide about half of the trained workers needed annually in Illinois, according to the above estimate. The part-time students should include large numbers of adults who are learning in order to keep up with developments in their lines of work, or who need to learn new fields.

Committee H believes that a statewide system of regional, comprehensive two-year colleges, each with a division to administer technical and semi-technical curriculums, should be established as soon as possible. The plan outlined by McLure and his co-authors, in which the state is divided into ten regions, may be taken as a model. The final decisions as to number and boundaries of regions, location of main and auxiliary centers, the number and choice of curriculums to be offered in each region, and other conditions and details will need to be developed by regional and state bodies established to administer the system. Plans for the system should make maximum use of established centers of technical and semi-technical education.

It is further believed that centralized state financial support and substantial centralized control are essential to high quality, efficiency, and flexibility in technical and semi-technical education in the state. High-quality technical education is relatively costly in faculty, buildings, and equipment. A curriculum should not be established unless it is quite clear that the enrollment will justify it. McLure and his co-authors have set the minimum efficient enrollment for a curriculum at approximately 50 full-time and 60 part-time students. On this basis, the number of regions in which it is recommended that a curriculum be established varies from one to ten, depending upon the estimated demand for graduates from the curriculum in the state as a whole (see Table 1, page 5). The semi-technical curriculums should have larger total enrollments and may be more widely distributed. Popular curriculums may be located at one or two auxiliary or extension centers in each region as well as at the regional centers (see Table V). A plan for a limited number of high-quality technical education centers implies that some students will attend a college not located in the region in which they live, particularly if they

wish to prepare to work in a field of limited demand. Flexibility in choice of curriculum will thus be aided by financing the statewide system primarily at the state level of government. These considerations of quality, efficiency, and flexibility point to the merits of accepting post-high-school education in the two-year colleges as a statewide enterprise, to be financed at the state level, except for federal support and tuition charges to students.